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In the
Supreme Court of the United States

OCTOBER TERM, 1968

CORN PRODUCTS COMPANY, *Petitioner*

vs.

BAXTER LABORATORIES, INC., *Respondent*

PETITION FOR A WRIT OF CERTIORARI TO THE UNITED STATES COURT OF APPEALS FOR THE SEVENTH CIRCUIT

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Petitioner, Corn Products Company, prays that a Writ of Certiorari issue to review the judgment of the United States Court of Appeals for the Seventh Circuit in the above-entitled case.

OPINIONS BELOW

The opinion of the Court of Appeals in this—a patent case—is reported at 394 F. 2d 892 and is reprinted in the Appendix to this petition, p. 3a. It reversed the judgment of the District Court for the Northern District of Illinois, Eastern Division, Judge James B. Parsons presiding, whose opinion does not appear in the printed reports but has been printed in the accompanying Appendix, p. 13a.

JURISDICTION

The judgment of the Court of Appeals was entered on May 1, 1968. A timely Petition for Rehearing was denied on June 7, 1968. An extension of the time to file this petition until September 23 was granted by this Court on September 3, 1968 and the Court of Appeals has likewise stayed the mandate until that day. The jurisdiction of this Court is invoked pursuant to 28 U.S.C. §1254 (1). The basis of jurisdiction in the District Court was 28 U.S.C. §§ 1338(a) and 2201.

QUESTIONS PRESENTED

The patent claims a process of producing crystalline dextrose from starch in which the improvement relied on for patentability is the use of a special enzyme as a catalyst in that old chemical process. The trial court found explicitly that the patent failed to disclose such an enzyme or how to produce one and held the patent invalid for that reason. The Court of Appeals did not hold such findings erroneous but reversed the trial court and reinstated respondent's patent monopoly.

There are two related but separate questions presented:

(1) Can a patent on an alleged improvement in an old process be valid under 35 U.S.C. 112 where it fails to provide the public with the very information required to achieve that improvement?

(2) Where the trial court has found the patent to have failed to disclose how to achieve the alleged improvement and has held the patent invalid under 35 U.S.C. 112 and where the Court of Appeals has, in disregard of Rule 52(a) of the Federal Rule of Civil Procedure, reversed the trial court

without determining such findings to be erroneous, has there been *due process,* under the Fifth Amendment to the Constitution?

THE CERTIORARI POLICY

Should not this Court now give thorough consideration to the requirements of 35 U.S.C. 112—the "full disclosure" section of the Patent Code and either reaffirm the principles of *Beidler* v. *United States,* 253 U.S. 447 (1920) or, if the law has changed as indicated by the Court of Appeals in this case, enunciate a clear new standard in this vital area? Section 112 is the section under which the patentee is required to disclose to the public the details of his invention as consideration for the grant of seventeen years of patent monopoly. By granting certiorari here, needed guidance can be afforded the circuit courts on this vital subject, and a remarkably erroneous application of that statute in this case can be rectified in one of our busiest patent circuits.

Grant of certiorari here would provide a fitting complement to the recent decision of this Court in *Graham et al.* v. *John Deere Company, et al.,* 383 U.S. 1 (1966), which has served so well to clarify and to regularize the lower courts' treatment of "obviousness" defenses under 35 U.S.C. 103.

INTRODUCTORY STATEMENT

This petition raises squarely for consideration by this Court the measure of the disclosure which an inventor must cede to the public before being entitled to the grant of the monopoly contemplated by Article I, Section 8 of the Constitution and afforded by this nation's Patent Laws. It focuses the Court's attention on the considera-

tion, the public's *quid pro quo,* for the patentee's grant of immunity under our antimonopoly laws and, indeed, for this government's encouragement and enforcement of the monopoly accorded the owner of a valid patent grant.

This Court has recently considered the question of patentable invention under Article I, Section 8, Clause 8 of the Constitution and Sections 101, 102 and 103 of the Patent Code of 1952, 35 U.S. Code.[1] The character and quality of discovery, or improvement susceptible of protection by a patent grant so considered has a concomitant in the character and quality of the knowledge made known to the public as a necessary consideration for the patent grant. Since the earliest days of English law, the permitted grant of a monopoly on new manufactures, as an exception to the prohibition of monopolies in general, has been conditioned on an adequate public disclosure of the method of making and using the new manufacture. (21 Jac. I, ch. 3, See 16 U.S. Appendix 13) This prerequisite was carried into the patent laws of the United States from the beginning of its patent system. (Patent Act of 1970, Section 2, 1 Statutes at Large 109)

The purpose and measure of a patent's disclosure were last stated by this Court in 1920:

> "Ever since *Grant* v. *Raymond,* 6 Pet. 218, 247, it has been consistently held that a correct and adequate description or disclosure of a claimed discovery (which, in the case of a machine, involves particularly the operation of it) is essential to the validity of a patent, for the reason that such a disclosure is necessary in order *to give the public the benefit of the*

[1] *Graham* v. *John Deere Co.,* 383 U.S. 1 (1966); *United States* v. *Adams,* 383 U.S. 39 (1966); *Brenner* v. *Manson,* 383 U.S. 519 (1966).

> *invention after the patent shall expire.* The source of the power to grant patents, and the consideration for granting them, is the advantage which the public will derive from them, especially after the expiration of the patent monopoly, when the discoveries embodied in them shall become a part of the public stock of knowledge." *Beidler* v. *United States,* 253 U.S. 447, 453 (1920).[2]

The Court of Appeals' reversal of Judge Parsons' holding of invalidity is in direct conflict with this Court's decision in the *Beidler* case.

The law of the *Beidler* case should either be clearly reaffirmed at this time of overwhelming technological explosion and the Court of Appeals' error in this case remedied, or the present statute (35 U.S.C. 112) should receive a thorough reappraisal. Increased sophistication of subject matter has never been an excuse for relaxation of the disclosure requirements of our patent laws. And increased uncertainty of knowledge about a subject matter resulting in the increased sophistication of our learning—where we do not always understand what we know—should not be an excuse for relaxation of the disclosure requirements of our patent laws. Rather it should be a reason for more stringent disclosure requirements, *i.e.,* more disclosure rather than less.

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[2] Emphasis added throughout unless otherwise indicated.

CONSTITUTIONAL PROVISIONS AND STATUTES INVOLVED

This case involves Article I, Section 8, Clause 8, of the Constitution, and Section 112 of the Patent Code of 1952, 35 U.S.C. 112.[3]

The appeal also involves the "Due Process" clause of the Fifth Amendment to Constitution.

STATEMENT

The trial court held the patent not infringed and invalid. (Appendix p. 36a)

The Court of Appeals reversed—holding the patent valid and infringed. (Appendix p. 11a)

The Wallerstein patent in suit, Patent No. 2,531,999, relates to the making of crystalline dextrose, a sugar akin to table sugar, from starch using a special enzyme[4] catalyst. (P. Exh. 1)[5] Sugar of this type is used as a

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[3] 35 U.S.C. 112 in pertinent part reads as follows:

> "The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same, and shall set forth the best mode contemplated by the inventor of carrying out his invention."

[4] The following general definition of an enzyme was stipulated prior to trial:

> "Enzyme: Specific, cell-independent catalysts of biological origin, which are proteinaceous and can be destroyed by heating."

[5] The references to the record are to the record printed by the parties as appendices to their briefs in the Court of Appeals which are designated PA for Appendix to

pharmaceutical and as a sweetner in commercial food products in amounts totalling more than five hundred million pounds annually. (DA. 23, 55)

The Starch-To-Dextrose Process Was Very Old

Petitioner has been one of the principal producers of crystalline dextrose from starch for more than forty years. Until 1960, it used an acid to catalayze the conversion of corn starch to dextrose. (D.A. 22-23) In that year, it was the first producer to shift from the acid to an enzyme catalyst.[6] (P. Exh. 95) It was that change which triggered this litigation.

Enzyme Catalysis of The Reaction Was Also Old

The Wallerstein patent purports to describe and claim an improved starch-to-dextrose process which comprises substituting for the acid a special enzyme catalyst. (P. Exh. 1, col. 1) But as the Court of Appeals correctly stated:

> "The possibility of using an enzyme preparation to hydrolyze starch to dextrose was known as early as

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[5] (Continued)
Brief of Plaintiff-Appellant, P.Exh. for Appellant's Exhibit Volume and DA for Appendix to Brief of Defendant-Appellee. References to the appendix to this petition are (Appendix p, ...).

[6] Both acid and enzyme conversion of starch to dextrose are processes in nature. Both, for example, are part of the human digestive system. The acid process takes place in the stomach and the enzyme process is carried out by saliva in the mouth. These body processes produce dextrose, the form of sugar which can be used in the blood stream. It is for this reason that dextrose has widespread pharmaceutical use. Encyclopedia Brittanica Vol. 16, p. 649 (14th Ed. 1955).

1927. The difficulty encountered was to effect such a hydrolysis of starch on an economical commercial basis." (Appendix p. 4a)[7]

The Patent Said It Was An Improvement Over The Acid Process

The application for the patent was filed in 1947 and issued in 1950. It referred to the then commercial, acid process as the standard of reference and stated:

> "It is the object of this invention to effect the hydrolysis of starch under such conditions that crystallization is markedly facilitated, the production of undesirable by-products of little value minimized, and increased yields of dextrose are obtained." (P. Exh. 1, Col. 1, lines 25-30)

Prior to 1960, when petitioner switched from the acid-catalyzed process to one employing an enzyme catalyst of its own development, no one had been able to produce crystalline dextrose from starch by enzymes with any advantage over the acid process and there was, therefore, no commercial use of an enzyme catalyst in such process. Petitioner was able to do it only after years of research which culminated in two important discoveries now covered by its own patents. (PA. 306-309) The trial court found those discoveries and not the Wallerstein patent essential to the use of an enzyme catalyst in such process. (Appendix p. 22a)

Judge Parsons after fifteen days of trial found that:

> "In 1960, the defendant substituted enzymes for acid as a hydrolyzing agent. This would *not have resulted in the economic commercial production* of crystalline dextrose if the immediately preceding developments had not been made *by the defendant.*" (Appendix p. 25a)

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[7] PA. 299; DA. 101, 127, 128

Those developments were *defendant's* new enzyme preparation and a method of separating the needed enzyme from an interfering enzyme called transglucosidase which occurs naturally therewith. (PA. 170, 175, 304-5; P. Exh. 186-197; Petitioner's Patents Nos. 3,012,944 and 3,042,584)

The Trial Court Found the Patent Discloses Only What The Enzyme Does— Not What It Is Or How To Produce It

Each of the claims of the Wallerstein patent calls for the reaction to be performed in the presence of an enzyme defined only in these terms:

> ". . . a microbiological enzyme preparation having a starch-glucogenase activity equivalent to an initial reaction value 'k' of at least 1.0. . .".

The "k" value is a number coined by Wallerstein to characterize an enzyme in terms of the amount of starch converted to sugar in a given length of time. (PA. 183, 567) It is a functional measure of the ability of an enzyme preparation to convert about 50 percent of starch to sugar in about half an hour. (PA. 125, 126; P. Exh. 2) It tells nothing of the identity or source of the enzyme preparation, only its functional ability—potency—in the starch-to-dextrose reaction. (PA. 117, 258, 399, 401-403, 566-568, 570, 598; DA. 45) In effect it says only "use an enzyme that works".

The trial court found that the patent utterly failed to disclose the identity of such enzyme or its method of preparation:

> "I am convinced from the testimony at the trial that this description of the 'k' value of the enzyme preparation is not described so as to provide one skilled in the art 'full, clear, concise, and exact'

directions as to *how to make an enzyme preparation with the potency needed for the successful practice of the process Wallerstein attempted to patent.*" (Appendix p. 29a-30a)

• • •

"In addition to the lack of specificity referred to already, the patent fails to identify the enzyme preparation employed in Examples 1 to 5 of the patent specification. *Nowhere throughout the specification or claims is there any identifiable enzyme preparation disclosed.*"

• • •

"*. . . there is no positive statement which indicates the specific microorganism used by the inventor.*" (Appendix pp. 34a, 35a)

The Court of Appeals did not even address itself to such findings. It did not say they were clearly erroneous. Yet it reversed Judge Parsons' holding of invalidity.

The Justification For A Switch From Acid To Enzyme Was Economics— While The Court Of Appeals Seems To Have Recognized This, Its Decision Is Inconsistent Therewith

The incentive for switching from acid to the enzyme process was cost reduction—economics. (Appendix p. 9a, 15a; PA. 309, 441, 442; P. Exh. 5, 61, 150, 173)

The Court of Appeals in addition to recognizing that enzyme catalysis for this purpose was known in 1927, acknowledged that:

"The difficulty encountered was to effect such a hydrolysis of starch on an economical commercial basis." (Appendix p. 4a)

But the Court of Appeals ignored the fact that no one had greater incentive in 1950 than the petitioner to adopt

an improvement over the acid process—if it were an improvement—and that it took almost ten years of petitioner's own research after the Wallerstein patent issued before it realized that goal. (PA. 306-309, 312)

In view of this, there was, to say the least, a need for the Court of Appeals to consider the trial court's findings and petitioner's evidence that the Wallerstein patent is invalid because neither the patent nor any other source of scientific information held the answer to how enzymatic hydrolysis could be made economically feasible *until petitioner—after years of its own research—succeeded in doing so in the late 1950's.* This the Court of Appeals failed to do.

The Court of Appeals demonstrated a second time its apparent recognition of the commercial facts of life—that irrespective of prior art on enzyme hydrolysis of starch, unless some *economic advantage* were achievable, there was no incentive for a crystalline dextrose manufacturer to switch from hydrochloric acid to enzyme—but casually dismissed the point:

> "Apparently the only reason defendant did not earlier change from acid hydrolysis was the cost involved and the difficulty in obtaining the enzyme needed." (Appendix p. 9a)

The word "only" is deceptively pregnant when one focuses on the facts that some twenty-three years had elapsed (from 1927 when enzyme hydrolysis of starch to dextrose was clearly taught in the art)[8] before the Wallerstein patent issued in 1950, and that yet another ten years expired before petitioner—who knew of the patent shortly after it issued—could begin the accused process. Since petitioner was one of the principal pro-

[8] DA. 127

ducers of crystalline dextrose at the time the patent issued and for almost three decades before (and had, indeed, experimented with enzyme catalysis for the purpose both before and after it issued)[9] the incentive to use an enzyme catalyst if it offered a commercial advantage, was obviously present in 1950.

Moreover, while the Court of Appeals recognized that Wallerstein's business was selling enzymes (Appendix p. 4a), it ignored the significance of the fact that neither he nor his company ever attempted to sell an enzyme for dextrose production or ever approached petitioner—one of the most likely customers—to sell an enzyme for the purpose or to attempt to interest it in the alleged invention until after petitioner had developed its own commercial enzyme process in 1960. (PA. 127, 133, 139) The irony is plain. Respondent—a pharmaceutical company which bought Wallerstein's company and its patent in 1958 and which has contributed even less than Wallerstein—now stands athwart petitioner's path and demands a toll on a process which the trial court said neither the patentee Wallerstein nor respondent Baxter had a thing to do with.[10]

The Trial Court Found Wallerstein's Patent Was Not The Basis For Petitioner's Process

Judge Parsons' decision after trial carefully evaluated the relation of the prior art on enzyme hydrolysis of starch to dextrose and petitioner's extensive research in the field leading up to its 1960 switch to enzyme catalyst along with the expert testimony as to what

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[9] PA. 312; DA. 163

[10] The trial court found Wallerstein to be a "paper patent" entitled to but limited scope at best. But again the Court of Appeals simply disagreed. (Appendix p. 9a, 14a)

information could, in fact, be derived from the disclosure of the patent. His explicit findings on those vital questions have been quoted above.

Judge Parsons also found in detail as to the reasons why it was more than thirty years after knowledge that enzymes could catalyze the starch to dextrose reaction before the use of such a catalyst offered any commercial advantage over acid in a crystalline dextrose process.

"* * * In about 1949, the defendant's research laboratory investigated the commercial feasibility of employing enzymatic conversion of starch with commercially available enzyme preparations as a substitute for acid conversion in their process of producing crystalline dextrose. This conversion produced 83% dextrose (dry basis), corresponding to a crystalline dextrose yield of 62%. This new process was not then competitive with acid conversion.

"Further research and investigation brought about improvement in enzyme production around 1954 by improvement in nutrient solution which increased enzyme yield (GA units per milliliter) by a factor of about 9 and increased dextrose content to 90% and crystalline yield to 78%. By 1956, the improvement to enzyme production had more than doubled the 1954 figure of GA units per milliliter. The dextrose content dropped slightly to 86% and the crystalline dextrose yield was 69%.

"The study of enzyme preparations for starch hydrolysis to dextrose conducted by the research department of Corn Products Company revealed the injurious effects of transglucosidase."

* * *

"I am satisfied from the evidence produced at the trial that the process employed by the defendant could not result in the economic commercial production of crystalline dextrose if a purified enzyme were not employed. *In other words, if the defendant did not treat the enzyme they employ so as to remove*

the transglucosidase activity, the results they achieve would not be superior to the acid conversion process which they had employed in the past."

• • •

"The defendant's process employs two important inventions which provide: (1) transglucosidase removal by an inexpensive absorption process, (Kooi et al 3,042,584), and (2) a microorganism that produces enzyme at a lower cost and with better glucamylase to transglucosidase ratio (Armbruster 3,012,944). Without at least the first of these inventions, defendant could not have gone into the production of crystalline dextrose by enzyme conversion." (Appendix pp. 23a-26a)

The Court of Appeals Demonstrated A Total Disregard For Judge Parsons' Findings Plus An Unexplained Bias Against Petitioner

In the face of the trial court's explicit findings that one skilled in the art could locate in the patent neither a usable enzyme nor directions on how to make one and despite Judge Parsons' further determination that petitioner had to experiment for years and make two important discoveries of its own in order to achieve a commercially useful enzyme process (Appendix p. 26a, 30a), the Court of Appeals' opinion—from the outset—reflected an unexplained and unexplainable attitude that the accused process was simply lifted from the patent:

"When the Wallerstein patent was issued, defendant's engineers and scientists read it and understood it."[11]

• • •

[11] This was true, but only in the sense that the reader of Jules Verne "understood" his writings. When someone finally reaches the moon, Verne will neither deserve nor receive the credit. A valid patent must be more than science-fiction or a mere statement of a desired goal.

"They [petitioner] experimented and tried the process and it worked."

• • •

"As plaintiff amply describes it, Wallerstein laid the road. The defendant drove over it." (Appendix p. 8a)

The Court of Appeals persisted along such a vein even though it found that the patent issued in 1950 but that petitioner—a very large producer of crystalline dextrose—had not even tried the alleged process until four years later:

"Answers to interrogatories indicated that defendants [sic] tested the procedure as early as 1954." (Appendix p. 8a)

As a matter of actual fact, the answer to the interrogatory does not say, as the Court of Appeals implies, that the petitioner ever carried out the process of the patent. (P. Exh. 95) To the contrary, the evidence is clear that petitioner never attempted that until this suit was brought and that it then could not determine what enzyme to use.[12] What petitioner did in 1954 was carry out a dextrose-from-starch process using an enzyme obtained from A. E. Staley & Co. (P. Exh. 9, 22)[13] as to which it was concluded by petitioner in 1954 the process

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[12] No one has been able to reproduce the examples of the process given in the patent. (PA. 164, 568) The enzyme preparations used by the patentee were secret, identified only by code names. They and their methods of preparation were trade secrets. Their identity was not known to the patentee's co-workers. (PA. 115, 117-119, 137-138) The patentee, Walllerstein, is dead. With him perished the details of the enzyme preparation.

[13] Staley & Co. had been using enzymes to convert starch to dextrose since about 1939 for commercial production of syrups. It started manufacture and sale of crystalline dextrose in about 1966. (PA. 184)

lacked commercial advantage over the acid process. (P. Exh. 147-150)

The Court of Appeals thus ignored the significance of the chronology it had itself expressed and reached a conclusion wholly inconsonant therewith. Although recognizing that petitioner, one of the largest crystalline dextrose producers for decades before the patent issued, first read the patent in 1950 (P. Exh. 172) and experimented with enzyme catalysis in 1954 (P. Exh. 108) but that it did not begin the accused process until 1960 (P. Exh. 95), it nevertheless wrote an opinion which would make it appear that petitioner had, upon issuance of the patent simply copied its process from the patent. The Court reached conclusions which would only make sense if the ten year lapse and the extensive research by petitioner had not occurred. The Court so telescoped those ten years between 1950 and 1960 as to make it appear that petitioner picked up the patent, read it, and immediately began using the process. The trial record is replete with evidence as to why neither petitioner nor anyone else could derive an economically useful process from the face of Wallerstein's patent. (PA. 309, 441, 442, 472; P. Exh. 5, 61, 150, 173)

REASONS FOR GRANTING THE WRIT

Section 112 and its predecessors have always provided that a patent shall contain a full description of the invention and that the same shall particularly point out and distinctly claim the invention. While this Court gave extensive consideration in 1946 to the claiming aspect of such statute in *Halliburton Co.* v. *Walker,* 329 U.S. 1 (1946), and such decision resulted in what is the third paragraph of the present statute (as revised in 1952), it has been since 1934 in *Stelos Co.* v. *Hosiery Corp.,*

295 U.S. 237, that the Court has given any consideration to the disclosure requirements of the statute and since 1920 that this Court has expressed itself on this vital aspect of patent law. *Beidler* v. *United States,* 253 U.S. 447 (1920)

In the light of the trial court's unequivocal findings of inadequate disclosure, the Court of Appeals' reversal of the holding of invalidity reflects either a flagrant disregard of those findings or a complete rejection of the law of *Beidler* v. *United States, supra.*[14]

Here, in a chemical process for converting starch to dextrose, the two courts below have each recognized the fact that patentability depended upon the use of a special enzyme. The trial court found explicitly that the patent not only failed to disclose how to obtain that special enzyme but that the patentee had failed to disclose the identity of a single enzyme used by him. The Court of Appeals did not determine those findings to be erroneous but apparently concluded that enzymes were exempt from the requirement of full disclosure because:

> "Modern science has not been able to chemically define enzymes. They are usually described by what they do, not by what they are." (Appendix p. 5a)

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[14] The concurring opinion of Mr. Justice Frankfurter and the dissenting opinion of Mr. Justice Burton disagreed on the requirements of the patent disclosure relating to microorganisms in *Funk Bros. Seed Co.* v. *Kalo Inoculant Co.,* 333 U.S. 127 (1948). The majority of this Court did not reach that question, holding instead that the subject matter of the patent was a product of nature and not patentable. The application of 35 U.S.C. 112 to the issues of the present case is thus still open.

and reversed the trial court's holding of invalidity.[15]

Symptomatic of the treatment given the trial court's findings and the evidence is this statement of the Court of Appeals—again in the face of unequivocal findings of the trial court that neither an enzyme nor its method of preparation was disclosed in the patent:

> "It is true that defendant's scientists discovered a more economical method to purify the niger enzyme by absorption of transglucosidase on bentonite clay. However, the enzyme is as described in Wallerstein."

There is absolutely no reference in the patent to a "niger enzyme" or to a method of purifying any enzyme, or to any method which might, even accidentally, remove transglucosidase or, indeed, was there anything which even suggested that the enzyme should be purified. (PA. 38, 117, 401, 403, 411-413, 419-420, 559, 568, 588, 589; DA. 45, 167) Judge Parsons found flatly that "k" value is not increased by removal of transglucosidase. (Appendix p. 23a) What was "described in Wallerstein" was nothing more than that an appropriate enzyme was one to be selected from some unnamed strain of the thousands of strains of Aspergillus mold which would produce the desired dextrose at a given rate, *i.e.*, would have the "k" value of the patent. This disclosure amounts to nothing more than an invitation to experiment. (PA. 588, 589) It is a matter of record that petitioner experimented for almost ten years after the patent issued before finding the answer to a commercially useful process.

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[15] The patentee could, however, have described the enzyme in other ways such that it would have been reproducible. See *Merck & Co.* v. *Chase Chemical Company*, 273 F. Supp. 68 (D.N.J. 1967). It is clear that the patent does not "set forth the best mode contemplated by the inventor of carrying out his invention." 35 U.S.C. 112

If The Court of Appeals Is Said To Have Accepted The Trial Court's Findings Of Inadequate Disclosure, It Erred In Holding That To Be No Impediment To Validity

The court below justified ignoring the trial court's unequivocal findings of inadequate disclosure in these words:

> "Modern science has not been able to chemically define enzymes. They are usually described by what they do, not by what they are." (Appendix p. 5a)

This statement is misleading at best and at worst is completely wrong. It nevertheless emphasizes the nature of the grave error into which the court has fallen.

If one assumes that enzymes can, in fact, only be defined functionally, *i.e.*, by what they do, it is clear from at least a hundred years of this Court's decisions that a patent which relies for its very novelty on the use of a special kind of enzyme simply cannot be valid. *Wood* v. *Underhill, et al.*, 46 U.S. 4 (1847). If, on the other hand, one assumes—quite apart from the question of what an enzyme is—that it is certainly possible to describe how to *produce* a specific enzyme (an assumption the record fully justifies, DA. 129-132, 113-121, 122-126) so that the public could follow the instructions, then it is equally clear that a patent which fails to do so is invalid under 35 U.S.C. 112. Any argument that the functional "k" of at least 1 was all the knowledge one skilled in the art would need is directly refuted by the evidence.[16] (PA. 169, 416; P. Exh. 151-152)

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[16] As to the significance of the "k" value, Judge Parsons found (Appendix p. 23a):

> ". . . results of experiments produced by the defendant at the trial demonstrated that increasing the 'k' value by precipitation did not remove transglucosidase nor increase dextrose yields. They also estab-

Here the Court of Appeals seems to have become so imbued with the idea that petitioner had, in effect, copied its process directly from the patent—despite the fact that the patent issued in 1950, that, by the Court's own chronology, petitioner learned of it immediately, but did not even try it until some time in 1954,[17] and did not adopt an enzyme catalyst until 1960 (ten years after the patent issued)—that it has failed to apply long-standing precedents and principles.

This Court in 1847, in *Wood* v. *Underhill, et al., supra,* expressed the governing principles which are as vital today as when first enunciated. There, the Court stated that if an alleged improvement "cannot be used with advantage . . . without first ascertaining by experiment . . ." how the invention is to be carried out:

> ". . . then the invention is not patentable. Because, by the terms of the act of Congress the inventor is not entitled to a patent unless his description is so full, clear, and exact as to enable any one skilled in the art to compound and use it."

and then went immediately on to express these legal truisms:

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lished that removal of transglucosidase did not substantially change the 'k' value. It was shown that removal of transglucosidase from the enzyme preparation resulted in raising the dextrose content of the hydrolyzate beyond the value which could be attained by use of the enzyme preparation from which transglucosidase had not been removed."

[17] The uncontroverted evidence at trial was that petitioner never tried "it" until after suit and then could not operate it because it could not determine the identity of Wallerstein's enzyme. What it had tried in 1954 was an uneconomical process based on an enzyme received from the A. E. Staley Co. (P. Exh. 22, 150)

> "And if from the nature and character of the ingredients to be used, they are not susceptible of such exact description, *the inventor is not entitled to a patent.* * * * And whether the fact is so or not is a question to be decided by a jury. . .".

Here, the Court of Appeals either accepted the trial court's findings and went wrong as a matter of law or usurped the function of the trial court on this vital fact issue without even addressing itself to the evidence underlying the court's findings or to the findings themselves. An erroneous decision had been reached, in either event.

If the Court of Appeals Is Said to Have Ignored The Trial Court's Findings And Therefore Its Responsibilities Under Rule 52, It Has Deprived Petitioner Of Due Process

Aside from a brief opening reference to the trial court's conclusion that the patent was invalid for failure to satisfy the requirements of 35 U.S.C. 112, the Court of Appeals' decision is remarkably devoid of reference to the findings of fact which underlay such conclusion. The Court of Appeals, indeed, discusses the matters bearing on validity as though the case were tried by it *de novo*—without any apparent recognition of its obligations under Rule 52.

Moreover, even in what appears to be a recounting of the undisputed facts, the Court of Appeals laced those "facts" with such obvious preconceptions as to make it clear that the very heart of Judge Parsons' findings had been rejected from the outset. The court never dealt directly with the critical findings or gave any reason for apparently ignoring them.

Judge Parsons found from the evidence at trial that respondent's patent failed to disclose the identity of a

single enzyme useful in the process or how to prepare the same. But the Court of Appeals skipped over that matter as though there were no dispute on the point:

> "The patent in suit discloses and claims as invention the basic steps necessary to the successful enzyme hydrolysis of starch. . .". (Appendix p. 6a)

Such use of the term "successful" in this statement at the threshhold of its opinion is symptomatic of the Court of Appeals' erroneous approach and, indeed, of its total disregard of the trial court's findings.

Rule 52(a) should be given particular weight where expert testimony must of necessity play an important role. Here the trial court had an opportunity not only to hear the qualifications of the experts but also from their demeanor and responses to form its opinion as to their credibility. The importance of this opportunity to observe where technical or scientific problems are before the court, as here, has been succinctly stated by this Court in *Graver Tank & Mfg. Co.* v. *Linde Air Products Co.*, 339 U.S. 605 (1950):

> "Like any other issue of fact, final determination requires a balancing of credibility, persuasiveness and weight of evidence. It is to be decided by the trial court and that court's decision, under general principles of appellate review, should not be disturbed unless clearly erroneous. Particularly in this so in a field where so much depends upon familiarity with specific scientific problems and principles not usually contained in the general storehouse of knowledge and experience." (pp. 609, 610)
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> "It is not for this Court to even assay an independent evaluation of this evidence. This is the function of the trial court. And, as we have heretofore observed, 'To no type of case is this . . . more appropri-

> ately applicable than to the one before us, where the evidence is largely the testimony of experts as to which a trial court may be enlightened by scientific demonstrations.' * * * 336 U.S. 271, 274-5." (p. 611)

Moreover, in this instance the Findings of the District Court were of its own composition. Petitioner was chagrined, indeed, when the District Court observed in its opinion that:

> "I have found the defendant's proposed findings of fact and conclusions of law rather unhelpful." (Appendix p. 27a)

It was not for the Court of Appeals to make an independent assay of the evidence. Wanting the knowledge requisite to make its own appraisal of what the patent specification disclosed, it necessarily had to depend upon the expert's testimony. The issue of the adequacy of a disclosure has from the earliest decisions been a question for the jury. *Wood* v. *Underhill*, 46 U.S. 1 (1847).[18]

The expert testimony was unequivocal, and, indeed, uncontroverted that with the patent before him "*extensive experimentation*" was required to have produced an enzyme having the function of "k of at least 1". (PA. 588) By "extensive experimentation" petitioner's expert meant: "Essentially original discovery, trial and error . . ". (PA. 589)

Rule 52 of the Federal Rules of Civil Procedure expressly proscribes just such an appellate review as was given here. Litigants are entitled to rely upon the knowledge that the trial judge's findings based upon live expert

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[18] *Evans* v. *Eaton*, 7 Wheaton 356, 428, 20 U.S. 356 (1822); *Hogg et al.* v. *Emerson*, 47 U.S. 437, 483 (1848); *Adamson* v. *Gilliand*, 242 U.S. 350, 353 (1917).

witnesses will stand unless the same are clearly erroneous. Here the key findings, on which consistent decisions of this court require a holding of invalidity, have not been held to be erroneous yet the trial court's judgment of invalidity has been reversed.

Billions of pounds of crystalline dextrose have been produced by the enzyme process since 1960. If this erroneous decision is permitted to stand, the industry, including petitioner, will be forced to account for its manufacture of vast quantities of this *unpatented commodity* by a process which the trial court found was *undisclosed in the Wallerstein patent.* If the mandate of the Court of Appeals is permitted to issue, a grievous wrong will be perpetuated and respondent will be permitted to exact tribute without due process of law.

SUMMARY

The trial court held that the Wallerstein patent for an allegedly improved enzyme-catalyzed process for converting starch to a form of sugar, called crystalline dextrose, was invalid after finding that it failed to contain a description in such full, clear, concise and exact terms as to enable a person skilled in the art to use it to obtain the alleged improvement.

An essential element of the process is the special enzyme preparation, obtained from living organisms, which is used in the process. Neither the identity of the particular organisms, the enzyme nor the procedure for obtaining a suitable enzyme preparation is disclosed in the patent.

The petitioner—a major crystalline dextrose producer for the last forty years—was able to achieve an improved

enzymatic process only after years of experiment and research, including the discovery of two patented advances of its own, and switched commercially from acid to enzyme catalysis of the process in 1960, ten years after issuance of the Wallerstein patent.

The Court of Appeals reversed, holding the Wallerstein patent description was adequate as a matter of law for the reasons that the enzyme preparation cannot be defined chemically. The Court of Appeals did not address itself to the trial court's findings of inadequate disclosure and did not hold them to be erroneous. Such disregard of findings of fact is a denial of *due process.*

The decisions of this Court under Section 112 of the Patent Statute have dealt most often with the scope of the monopoly claimed by a patentee, and in a relatively few instances with the adequacy of a patent description in mechanical and composition of material cases.

The Court of Appeals in this case has applied a rule of law in direct opposition to the law of this Court in those instances, particularly as announced in *Wood* v. *Underhill, et al.,* 46 U.S. 4 (1847), and *Beidler* v. *United States,* 253 U.S. 447, 453 (1920). The Court should consider and determine the application of the Patent Statute to the disclosures of patents in the advanced technology of today to prevent the burden of a patent monopoly on commerce without a disclosure which will, in fact, enrich the storehouse of public knowledge.

CONCLUSION

For the reasons stated, the petition for writ of certiorari should be granted.

Respectfully submitted,

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